



AN OVERVIEW ON: AI STOCK FORECASTER: A STOCK PRICE FORECASTING APP

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Abstract: In the past decades, there is an increasing interest in predicting markets among economists, policymakers, academics and market makers. The objective of the proposed work is to study and improve the supervised learning algorithms to predict the stock price. The stock market plays a crucial role in a country's financial growth, but it is also highly dynamic and unpredictable. Stock Market Analysis of stocks using data mining will be useful for new investors to invest in stock market based on the various factors considered by the software. Stock market includes daily activities like Sensex calculation, exchange of shares. The exchange provides an efficient and transparent market for trading in equity, debt instruments and derivatives.

Keywords: Stock Market, ARIMA, LSTM, Linear Regression, Web Interface, Machine Learning, Linear Regression, Python, Django framework, Yahoo Finance.

I. INTRODUCTION

Today, the platforms where stocks are bought, sold, and traded are called stock markets. These bought and sold assets can be stocks, bonds, and similar commodities, namely gold, oil or agricultural products. Thanks to these transactions, like buying and selling stocks, the stock market provides capital resources to individual investors and companies while also having a number of economic indicators that meet the fund requirements.

In addition to these features, the stock market is based on existing shares and investors' expectations about companies, and these expectations can be affected by many local and global factors. For this reason, stocks on the stock market have a variable and dynamic structure that may have any increasing or decreasing tendency. Although this variable structure makes it difficult to make predictions, it makes the stock market itself attractive for individual investors and companies.

II. METHODOLOGY

The methodology of the AI Stock Forecaster project involves a series of systematic steps to collect, process, analyze, and predict stock market trends using machine learning techniques.

1) Data Collection:

Historical stock market data is collected from reliable financial APIs such as Yahoo Finance, Alpha Vantage, or similar sources. The dataset typically includes Open, Close, High, Low prices, Trading Volume, Adjusted Close values, and date-wise time series data.

2) Data Preprocessing:

The raw data is cleaned and prepared for analysis. This involves handling missing or null values, converting date columns into a proper time-series format, normalizing or scaling the data for better model performance, and selecting relevant features.

3) Exploratory Data Analysis (EDA):

Data visualization techniques are applied to understand stock trends and patterns. Line charts are used to observe price movements, moving averages help in identifying trends, and correlation analysis is performed between features.



4) Feature Engineering:

New features are created to improve prediction accuracy. These include moving averages such as MA 50 and MA 100, daily returns, lag features based on previous day prices, and volatility indicators.

5) Model Development and Training:

Machine learning and deep learning models such as Linear Regression, ARIMA, and LSTM are applied for forecasting. The dataset is split into training and testing sets, and the model is trained using historical data by minimizing error using optimization techniques like Mean Squared Error.

6) Prediction and Evaluation:

The trained model is used to predict future stock prices based on past trends. Model performance is evaluated using metrics such as RMSE and MAE. The predicted values are compared with actual stock prices, and results are visualized to assess accuracy and reliability.

III. FLOWCHART

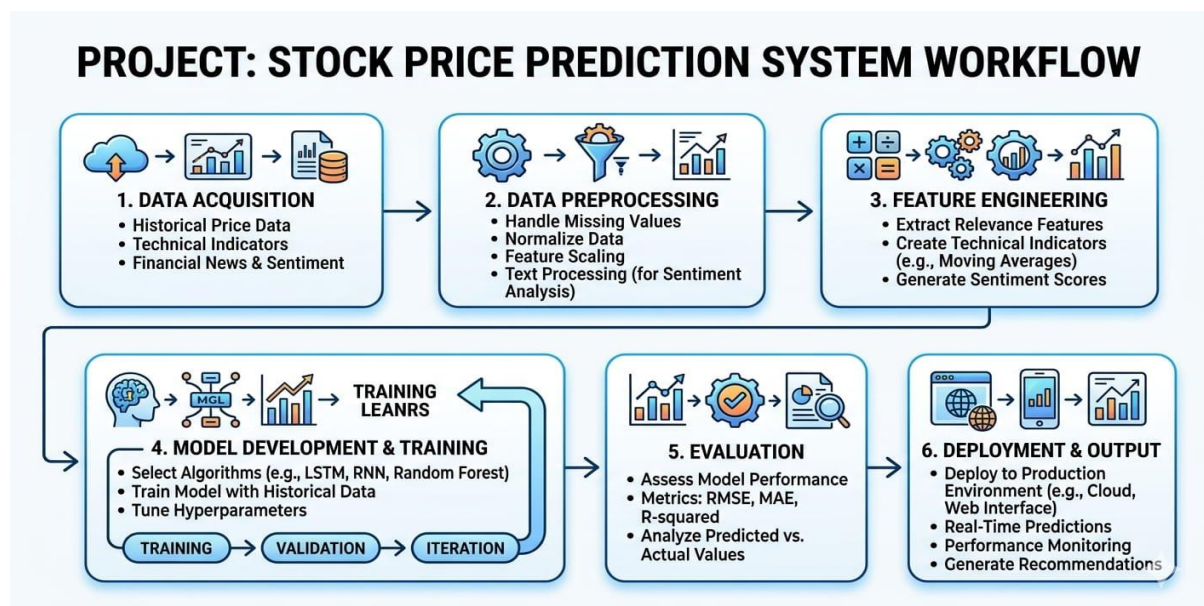


Fig.1: Flow of AI Stock Forecaster App

IV. RESULTS AND DISCUSSION

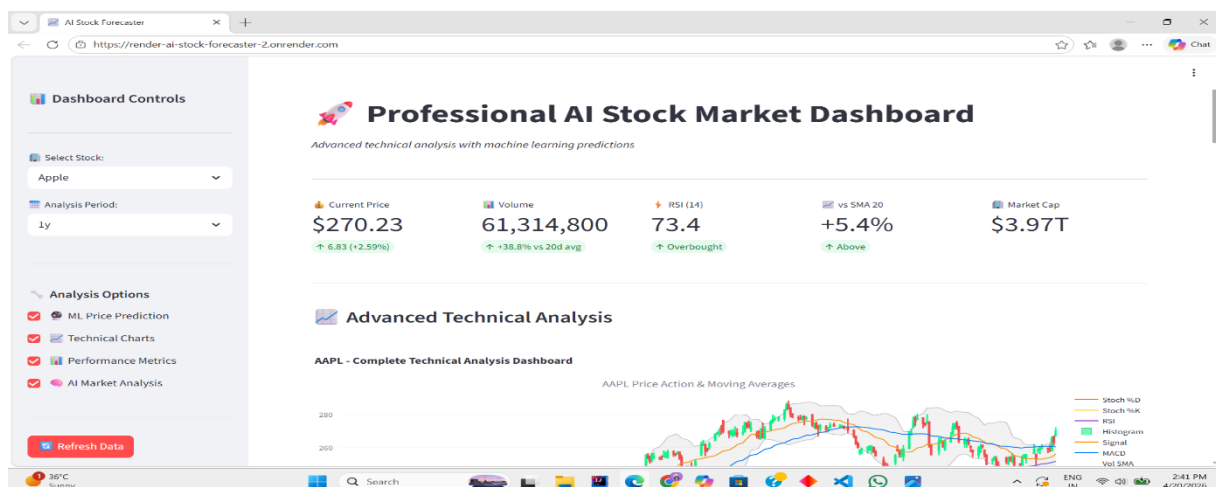


Fig.2: AI Stock Forecaster App Home Page



Discussion: It is the homepage of the project from where we can navigate to other pages of the website i.e., Select Stock, Analysis Period, Analysis Options, etc.

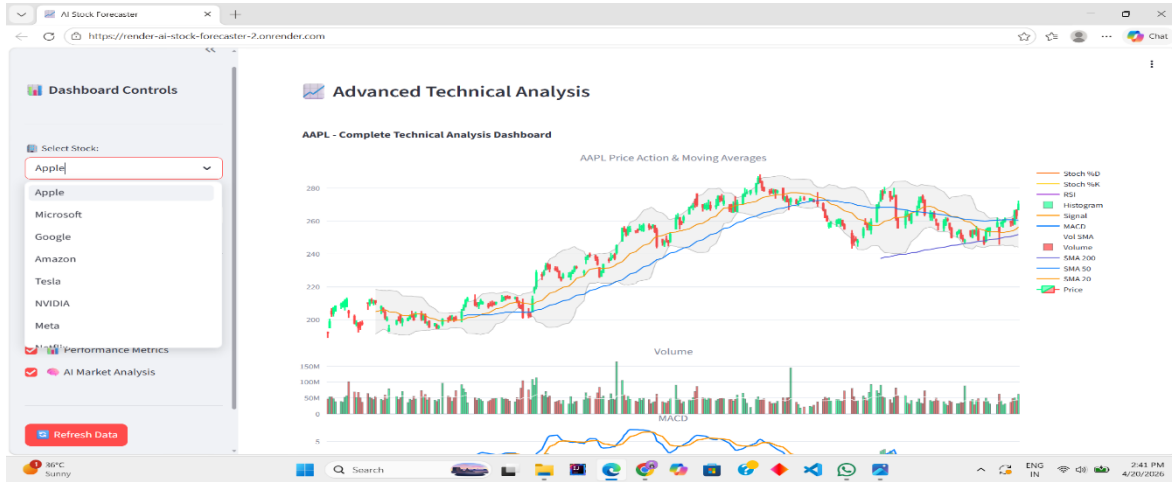


Fig.3: Browse Stocks

Discussion: Browse Stocks is the step where can Select different Stocks for Analysis.

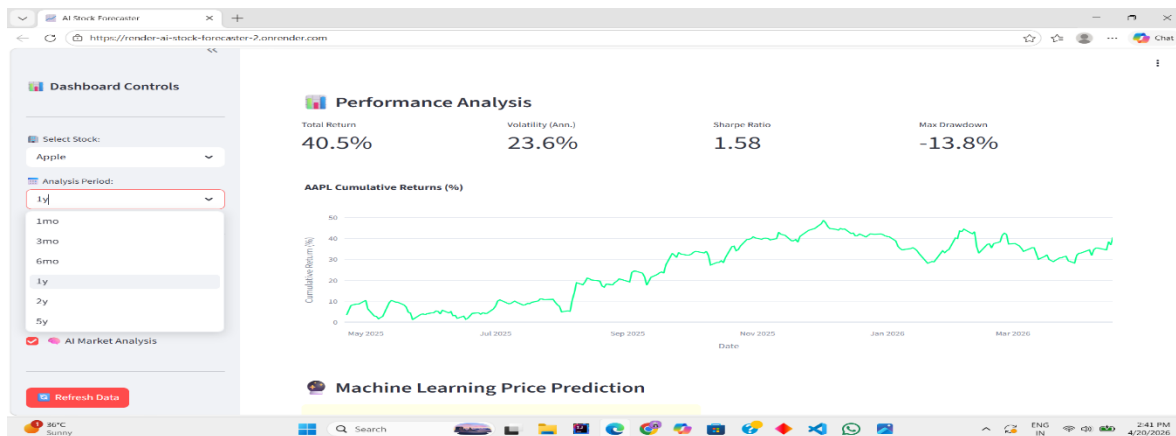


Fig.4: Analysis Period Selection

Discussion: Here can select the required Analysis Period for the analysis of Stocks Price.

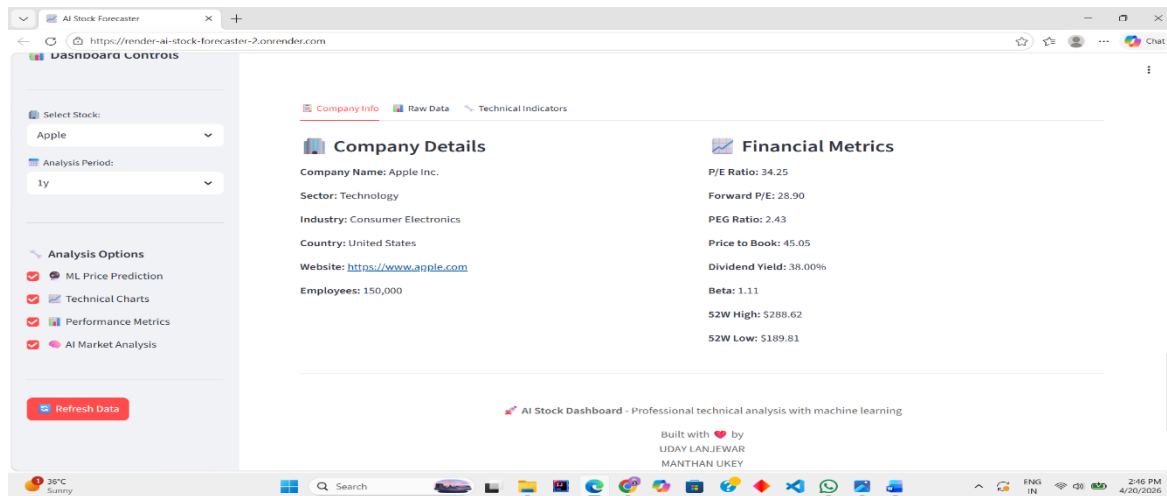


Fig.5: Analysis Options Selection

Discussion: Here the different options for Stock Price Prediction.

V. CONCLUSION

By measuring the accuracy of the Linear Regression algorithms, we found that the most suitable algorithm for predicting the market price of a stock based on various data points from the historical data. The algorithm will be a great asset for brokers and investors for investing money in the stock market since it is trained on a huge collection of historical data and has been chosen after being tested on a sample data. The project demonstrates the machine learning model to predict the stock value with more accuracy as compared to previously implemented machine learning models.

ARIMA and PROPHET generated a consistent model when there was a strong seasonal pattern in the data, whereas the LSTM model was able to identify the type of seasonality in the data and decompose the time series based on the type of seasonality and accurately predicted for all 5 banks. When comparing the statistical models and neural network, seasonal data is better handled by LSTM model than ARIMA and PROPHET, which suggests that LSTM was able to predict data with a strong pattern.

While comparing the RMSE for every model for each bank, it has been observed that the performance of statistical methods differ from Recurrent Neural Network (RNN) method because RNN method is more suitable than statistical models in predicting the stock market returns, which needs to be adapted in a case for stock price prediction.

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